LATHROP & GAGE LAW OFFICES

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314 East High Street
Jefferson City, MO 65101
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10851 Mastin Blvd.
Building 82, Suite 1000
Overland Park, KS 66210-1669
(913) 451-5100, Fax (913) 451-0875

1845 S. National
Springfield, MO 65808-4288
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1010 Market Street
Suite 1300
St. Louis, MO 63101-2000
(314) 613-2500, Fax (314) 613-2550

1200 G Street, N.W.
Suite 800
Washington, D.C. 20005
(202) 434-8984, Fax (202) 434-8992

June 29, 2004

From: Curtis A. Vock **Matter No.: 389335**

To:	Company:	Fax Number:	Phone Number:
Examiner David A. Vanore	Technology Center 2881 United States Patent Office	703-872-9306	571-272-2483

Number of Pages Transmitted (including this cover sheet): 31

Message:

Dear Examiner Vanore:

We submit the following documents in U.S. Application No. 10/032,664, filed 19 October 2001:

1. Certificate of Transmittal (1 page);
2. Transmittal Form SB-21 (1 page);
3. Petition to Withdraw Holding of Abandonment (2 pages);
4. Courtesy copy of the Response and related papers filed 2/24/2004 (23 pages)
5. copy of USPTO-stamped confirmation postcard and Express Mail label, both dated 2/24/2004 (1 page), and
6. Copy of Notice of Abandonment (2 pages)

Thank you for your attention to this transmittal.

If you have a problem receiving this facsimile, please call: (720) 931-3000 Fax Attendant: _____

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF TRANSMISSION (37 CFR 1.8) Applicant(s): Donald W. Berrian			Atty. Docket No. 389335
Serial No. 10/032,664	Filing Date 19 October 2001	Examiner David A. Vanore	Group Art Unit 2881

Date of Transmittal: 29 June 2004

I hereby certify that the following documents:

1. Certificate of Transmittal (1 page);
2. Transmittal Form SB-21 (1 page);
3. Petition to Withdraw Holding of Abandonment (2 pages);
4. Courtesy copy of the Response and accompanying documents filed 2/24/2004 (23 pages);
5. Photocopy of the USPTO-stamped confirmation postcard and Express Mail label, both dated 2/24/2004 (1 page), and
6. Copy of Notice of Abandonment (2 pages), and
7. Facsimile cover sheet.

are being transmitted to facsimile number 703 872 9306, to TC2881, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date indicated above.

	Linda Levin
	Name of Depositor/Transmitter
	Signature of Depositor/Transmitter

PTO/SB/21 (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	10/032,664
Filing Date	19 October 2001
First Named Inventor	Donald W. Berrian
Art Unit	2881
Examiner Name	David A. Vanore
Total Number of Pages in This Submission: 31	Attorney Docket Number: 389335

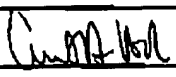
ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment / Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☒ Petition **[to withdraw holding of abandonment]**
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) *(please identify below)*:

  Copy of Notice of Abandonment; copy of Amendment and related documents filed 2/24/2004; copy of USPTO-stamped postcard and Express Mail receipt dated 2/24/04; Certificate of Fax Transmittal, and Fax Cover Sheet

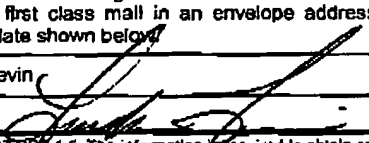
Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Curtis A. Vock
Signature	
Date	29 June 2004

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Typed or printed name	Linda Levin		
Signature		Date	29 June 2004

Applicant: Donald W. Berrian
Serial No.: 10/032,
Filed: 19 Octo[illegible] 2001
For: SYSTEM AND METHOD FOR RAPIDLY CONTROLLING THE OUTPUT OF AN ION SOURCE FOR ION IMPLANTATION

Attorney Docket No.: 389335
Client: Prot LLC

Please acknowledge receipt of the following by stamping this card with the date received and returning it to the address on the reverse:

Applicant: Donald W. Berrian
Serial No.: 10/032,664
Filed: 19 October 2001
For: SYSTEM AND METHOD FOR RAPIDLY CONTROLLING THE OUTPUT OF AN ION SOURCE FOR ION IMPLANTATION

Attorney Docket No.: 389335
Client: Proteros, LLC

Please acknowledge receipt of the following by stamping this card with the date received and returning it to the address on the reverse:

1. Transmittal Form 1449A/PTO (1 page);
2. Fee Transmittal, in duplicate, authorizing charges to Deposit Account (2 pages);
3. Petition for 3 Mo. Extension, in duplicate, authorizing charges to Deposit Account (2 pages);
4. Response to Office Action (17 pages);
5. Certificate of Mailing; and
6. Return Postcard

Express Mail Label No. EV 386865305 US

Curtis A. Vock
Reg. No. 38,356
24 February 2004

Mailing Label
Label 11-F June 2002

Office To Addressee

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Customer Copy
Label 11-F June 2002

EV 386865305 US

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LATHROP & GAGE LLC
4845 PEARL EAST CIR STE 300
BOULDER CO 80301-0113

3
Proteros 989335/cav/jl/hf/11

TO: (PLEASE PRINT) PHONE

Attn: FEE AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Attorney Docket No. 389335

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s)	Donald W. Berrian	Examiner	David A. Vanore
Serial No.	10/032,664	Group Art No.	2881
Filed	19 October 2001	Attorney Docket No.	389335
For:	SYSTEM AND METHOD FOR RAPIDLY CONTROLLING THE OUTPUT OF AN ION SOURCE FOR ION IMPLANTATION		

CERTIFICATE OF TRANSMITTAL UNDER 37 C.F.R. 1.8

I hereby certify that, on the date shown below, this correspondence is being transmitted to facsimile number 703 872- 9306 to: Group Art Unit 2881, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

6/29/04
Date

Linda Levin

29 June 2004

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TECHNOLOGY CENTER 2800
SPECIAL PROGRAM CENTER

Attn: Group Art Unit 2881
Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION TO WITHDRAW EXAMINER'S HOLDING OF ABANDONMENT

Sir:

Pursuant to 37 CFR 1.181(a), Applicant hereby petitions for withdrawal of the holding of abandonment in the above-identified application. Per telephone messages received from Examiner Vanore and the Office of Patent Legal Administration on June 23, 2004, Applicant addresses this communication to Group Art Unit 2881.

STATEMENT OF THE FACTS

Applicant timely filed a Response to the Office Action of August 25 2003 via Express Mail Label Number EV 386865305 US, on 24 February 2004, along with the necessary Petition for a Three Month Extension of Time and authorization to charge the necessary fees to Deposit Account Number 12-0600. However, a Notice of Abandonment has been issued in the case, citing failure to respond to the August 25 Office Action as the reason for Abandonment.

Applicant submits herewith a copy of the Notice of Abandonment a courtesy copy of

the Response and accompanying papers, and proof of timely filing in the form of:

a) a photocopy of Express Mail Label EV 386865305 US, with a "date in" of 2-24-2004, and

b) a photocopy of the itemized return postcard, date-stamped 24 February 2004 by the Office of Initial Patent Examination.

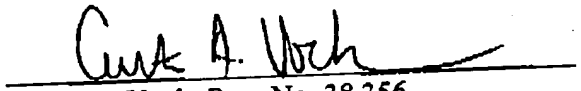
As demonstrated by items a) and b), Applicant's response to the Office Action of 25 August 2003 was timely filed. Applicant believes that the instant application was erroneously abandoned due to late association of papers at the Patent Office.

ACTION REQUESTED

Applicant requests withdrawal of the holding of abandonment and formal notification of such withdrawal.

Applicant believes that no fees are due; however, if any fee is deemed necessary in connection with this Petition, the Examiner is authorized to charge Deposit Account No. 12-0600. Please call the undersigned with any questions.

Respectfully submitted



Curtis A. Vock, Reg. No. 38,356
Lathrop & Gage, L.C.
4845 Pearl East Circle, Suite 300
Boulder, CO 80301
Telephone: (720) 931-3011
Facsimile: (720) 931-3001

pw

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,664	10/19/2001	Donald W. Berrian	389335	6893

30955 7590 04/20/2004

LATHROP & GAGE LC
4845 PEARL EAST CIRCLE
SUITE 300
BOULDER, CO 80301

EXAMINER	
VANORE, DAVID A	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

To K.C.
Date 4/23/04
From BH

PTO-90C (Rev. 10/03)

Notice of Abandonment	Application No. 10/032,664	Applicant(s) BERRIAN, DONALD W.	
	Examiner David A Vanore	Art Unit 2881	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address–

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 25 August 2003.
   (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
   (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection. (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
   (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
   (d) ☒ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
   (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
   (b) ☐ The submitted fee of $_____ is insufficient. A balance of $_____ is due. The issue fee required by 37 CFR 1.18 is $_____. The publication fee, if required by 37 CFR 1.18(d), is $_____.
   (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
   (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
   (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The reason(s) below:

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

Practitioner's Docket No. 389335 **COPY** ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Donald W. Berrian

Application No.:	10/032,664	Group No.:	2881
Filed:	19 October 2001	Examiner:	David A. Vanore

For: SYSTEM AND METHOD FOR RAPIDLY CONTROLLING THE OUTPUT OF AN ION SOURCE FOR ION IMPLANTATION

ATTN: FEE AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

EXPRESS MAIL CERTIFICATE

"Express Mail" Label No. EV 386865305 US
Date of Deposit: 24 February 2004

EV386865305US

I hereby state that the following *attached* papers

1. Transmittal Form 1449A/PTO (1 page);
2. Fee Transmittal, in duplicate, authorizing charges to Deposit Account (2 pages);
3. Petition for 3 Mo. Extension, in duplicate, authorizing charges to Deposit Account (2 pages);
4. Response to Office Action (17 pages);
5. Certificate of Mailing; and
6. Return Postcard

are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10, on the date indicated above and is addressed to: ATTN: FEE AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Linda Levin

COPY

PTO/SB/21 (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	10/032,664
Filing Date	19 October 2001
First Named Inventor	Donald W. Berrian
Art Unit	2881
Examiner Name	David A. Vanore
Total Number of Pages in This Submission: 23	Attorney Docket Number: 389335

ENCLOSURES *(check all that apply)*

- ☒ Fee Transmittal Form
  - ☐ Fee Attached
- ☒ Amendment / Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☒ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) ____
- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) *(please identify below)*:
  Certificate of Mailing, and Return Postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Curtis A. Vock
Signature	Curt A. Vock
Date	24 Feb 2004

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service [Express Mail Post Office to Addressee service under Express Mail Label No. EV 388865305 US] with sufficient postage in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Typed or printed name	Linda Levin		
Signature		Date	2/24/04

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Express Mail Label No. EV 386565305 US

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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FEE TRANSMITTAL for FY 2004

COPY

Effective 10/01/2003. Patent fees are subject to annual revision.

☒ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 475

Complete if Known	
Application Number	10/032,664
Filing Date	19 October 2001
First Named Inventor	Donald W. Benian
Examiner Name	David A. Vanore
Art Unit	2851
Attorney Docket No.	389325

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account

Deposit Account Number: 12-0600

Deposit Account Name: Lathrop & Gage L.C.

The Director is authorized to: *(check all that apply)*
☒ Charge fee(s) indicated below ☒ Credit any overpayments
☐ Charge any additional fee(s) during the pendency of this application
☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($) 0

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

			Extra Claims		Fee from below	=	Fee Paid
Total Claims		-20 **	= 0	X		=	0
Independent Claims		-3 **	= 0	X		=	0
Multiple Dependent				X		=	0

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0

**or number previously paid, if greater; For Reissues, see above

FEE PAYMENT (required)

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	475
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive – unavoidable	
1453	1,330	2453	665	Petition to revive – unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17 (q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) ____

*Reduced by Basic Filing Fee Paid SUBTOTAL (3) ($) 475

SUBMITTED BY					Complete (if applicable)
Name (Print/Type)	Curtis A. Vock	Registration No. (Attorney/Agent)	38,356	Telephone	(720) 931-3000
Signature				Date	2/24/04

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing this form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Express Mail Label No. EV 388[illegible]305 US

PTO/SB/22 (06-03)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 389335

COPY

In re Application of Donald W. Berrian	
Application Number 10/032,664	Filed 19 October 2001
For SYSTEM AND METHOD FOR RAPIDLY CONTROLLING THE OUTPUT OF AN ION SOURCE FOR ION IMPLANTATION	
Art Unit 2881	Examiner David A. Vanore

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- ☐ One month (37 CFR 1.17(a)(1)) $____
- ☐ Two months (37 CFR 1.17(a)(2)) $____
- ☒ Three months (37 CFR 1.17(a)(3)) $950
- ☐ Four months (37 CFR 1.17(a)(4)) $____
- ☐ Five months (37 CFR 1.17(a)(5)) $____

☒ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: $ 475 .

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 12-0600 .
I have enclosed a duplicate copy of this sheet.

I am the
☐ applicant/inventor.
☐ assignee of record of the entire interest. See 37 CFR 3.71
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).
☒ attorney or agent of record. Registration Number 38,356
☐ attorney or agent under 37 CFR 1.34(a).
Registration number if acting under 37 CFR 1.34(a). _____ .

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

2/24/04
Date

[signature]
Signature

(720) 931-3000
Telephone Number

Curtis A. Vock
Typed or printed name

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☒ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	10/032,664
Applicant	:	Donald W. Berrian
Filed	:	19 October 2001
Title	:	SYSTEM AND METHOD FOR RAPIDLY CONTROLLING THE OUTPUT OF AN ION SOURCE FOR ION IMPLANTATION
TC/A.U.	:	2881
Examiner	:	David A. Vanore
Confirmation No.	:	6893

Certificate of Mailing Under 37 CFR 1.10

I hereby certify that this correspondence, along with any and all papers referred to as being attached or enclosed, are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service on the date shown below, in an envelope with sufficient postage, bearing Express Mail Label No. EV 386865305 US, and addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

6/29/04
DATE

Linda Lyon

ATTN: FEE AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

Sir:

These remarks are responsive to the Office Action of 25 August 2003. Please amend the above-identified application as follows:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims that begins on page 5 of this paper.

Remarks/Arguments begin on page 9 of this paper.

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AMENDMENTS TO THE SPECIFICATION

Please amend the first paragraph of the Detailed Description on page 6 as follows:

--As an aid to understanding the present invention, reference is made to Fig. 1 which shows a conventional Bernas ion source 1. This ion source 1 includes an ion chamber 10 and an extraction electrode assembly 40 that extracts an ion beam 18 from the ion chamber. The ion chamber 10 includes first and second sides 11, 12, walls 13, 14 that form the anode, a filament 15 acting as a cathode that passes through first side 11, a filament power supply 24 and an ~~electrode~~ mirror electrode 30 which is electrically coupled to one side of filament 15, and passes through second side 12. The ion chamber 10 is fitted with a gas feed 26 to supply ion precursor gas into ion chamber 10 and an exit slit 16 located in wall 14 through which ion beam 18 is extracted from chamber 10. Once ion beam 18 is extracted, ~~-~~extraction electrode assembly 40 accelerates ~~-~~ion beam 18 toward a mass analyzing system associated with an ion implanter (not shown).--

Please amend the second paragraph of page 8 as follows:

--An arc power supply 134 is electrically coupled to filament 115 and ion chamber walls 113, 114. A mirror programming circuit 150 is electrically coupled to filament power supply 124, arc power supply 134 and mirror electrode 130 as shown in Fig. 2. Mirror programming circuit 150 is operable to control the potential on mirror electrode 130 relative to filament 115. Specifically, mirror programming circuit 150 controls the number of electrons trapped between the filament and mirror electrode and thus the rate of ionization of the gas and the resulting beam current. Mirror programming circuit 150 drives the voltage potential on ~~electrode~~ mirror electrode 130 to approach the voltage potential of either filament 115 – in the case where beam intensity is to be increased – or walls 113, 114 – in the case ~~were~~where the beam intensity is to be decreased. When the error signal 152 potential approaches that of filament 115, the number of electrons available for ionization is increased because the potential imposed on mirror electrode 130 repels electrons back toward the center of the chamber. When the error signal potential approaches that of walls 113, 114 and thus the signal 152 potential is positive relative to filament 115 electrons are attracted to and absorbed by the mirror. This reduces the number of electrons available for ionization and, in turn, reduces the rate of ionization of the gas and results in the desired reduction in beam intensity. --

Please amend the paragraph beginning at the bottom of page 8 and concluding on page 9, as follows:

-- Shown in Fig. 4 is a plot showing the relationship of beam current to mirror voltage encountered during the operation of the ion chamber shown in Fig. 2. The plot shows the reduction in beam current that can be achieved by driving the mirror voltage potential toward the potential of the chamber wall. Specifically, Fig. ~~3~~4 shows how the beam current, and thus beam intensity, can be reduced by driving the mirror electrode voltage potential from that imposed on the filament to that imposed on the chamber wall. When making adjustments to the beam current, the difference in ion chamber system response time between the prior art systems discussed above and the present invention is significant. The heating and cooling of the filament in the prior art has typically about a 0.5 second time constant because of the heat capacity of the filament. By contrast, the electron transit time across the arc chamber is measured in microseconds, so response times below 10 to 20 microseconds can be expected from the control of the electronic flux by the system shown in Fig. 2.--

Please amend the paragraph beginning at the bottom of page 9 and concluding on page 10, as follows:

--Shown in Fig.~~4~~3 is an alternative embodiment of the ion source of the present invention. In this embodiment, an electrode with an aperture is introduced between filament 215 and the remainder of the ion chamber 210. The chamber 210 comprises first and second sides 211-, 212 and walls 213, 214, which define the ion chamber and form the anode. Similar to the first embodiment of the present invention, ion chamber 210 is fitted with filament 215 (acting as the cathode) that extends through first side 211, a filament power supply 224 coupled to filament 215, a gas feed 226 and a mirror electrode 230 disposed within wall 212. The resulting ion beam 218 passes through exit slit 216 disposed in wall 214. --However, this embodiment includes a grid electrode 240 having an O-shaped grid portion 242 and an outwardly extending support leg 244 as shown in Fig 3. Grid portion 242 presents aperture 246 defined by loop portion 248. Leg 244 passes through and is secured to wall 213 so that grid electrode 240 can be located within ion chamber 210 with the grid portion 242 located in relative proximity to filament 215. Grid electrode 240 is configured to operate like a grid in a conventional vacuum tube and thus it will be

understood that more than one grid may be employed in the ion source without departing from the scope of the present invention. --

IN THE CLAIMS

1. (Currently amended) A method for rapidly controlling the rate of ion generation in an ion source having a filament-cathode and a mirror electrode, the ion source being operable to generate an ion beam from the ionization of an ion precursor gas present in ~~the~~a chamber by electrons emitted from the filament-cathode, the method comprising the steps of:

supplying current to said filament-cathode;

supplying current to said mirror electrode; and

controlling the potential difference between said filament-cathode and said mirror electrode by modifying the potential of the mirror electrode to control the number of electrons available for ionization.

2. (Currently amended) The method of claim 1 further comprising the step of reducing ~~the~~an ion beam intensity by driving the potential of the mirror electrode positive relative to the filament-cathode.

3. (Currently amended) The method of claim 1 further comprising the step of increasing ~~the~~an ion beam intensity by driving the potential of the mirror electrode ~~to negatively~~ negative ~~bias the mirror electrode~~ relative to the filament-cathode ~~of the ion chamber~~.

4. (Currently amended) The method of claim 1 wherein the filament-cathode is a directly heated filament-cathode.

5. (Currently amended) The method of claim 1 wherein the filament-cathode is an indirectly heated filament-cathode.

6. (Original) The method of claim 1 further comprising the step of modulating the number of electrons in a manner that varies the ion beam from a first intensity to a second intensity during a time frame of less than one millisecond.

7. (Currently amended) A method for rapidly controlling the rate of ion generation in an ion source having a filament-cathode, a mirror electrode, and at least one grid, the ion source being operable to generate an ion beam from the ionization

of an ion precursor gas present in ~~thea~~ chamber by electrons emitted from the filament-cathode, the method comprising the steps of:

supplying current to said filament-cathode;

supplying current to said mirror electrode;

supplying current to the grid, and

controlling the potential difference between said filament-cathode and said grid by modifying the potential of the grid relative to the filament-cathode to control the number of electrons available for ionization between the grid and the mirror electrode.

8. (Currently amended) The method of claim 7 further comprising the step of reducing ~~thean~~ ion beam intensity by driving the potential of the grid positive relative to the filament-cathode.

9. (Currently amended) The method of claim 7 further comprising the step of increasing ~~thean~~ ion beam intensity by driving the potential of the grid to negatively bias the grid relative to the filament-cathode.

10. (Currently amended) The method of claim 7 wherein the filament-cathode is a directly heated filament-cathode.

11. (Currently amended) The method of claim 7 wherein the filament-cathode is an indirectly heated filament-cathode.

12. (Original) The method of claim 7 further comprising the step of modulating the number of electrons in a manner that varies the ion beam from a first intensity to a second intensity during a time frame of less than one millisecond.

13. (Currently amended) An improved ion source apparatus for rapidly modulating ~~thean~~ intensity of an ion beam, comprising:

an ion chamber having mutually opposed sides and configured to receive an ion precursor gas;

a filament-cathode located on one side of said ion chamber and operable to emit electrons for ~~the~~ ionization of the ion precursor gas for ~~the~~ generation of the ion beam; and

a mirror electrode having a potential associated therewith and located on the other side of said ion chamber, said mirror electrode being connected to a circuit to vary its potential -relative to said filament-cathode so as to vary the number of the electrons available in the ion chamber for ionization.

14. (Currently amended) The apparatus of claim 13 wherein said mirror electrode is operable for modulating the ion beam ~~between~~from a first intensity to a ~~and~~ second intensity during a time frame of less than 1 millisecond.

15. (Currently amended) The apparatus of claim 13 wherein the filament-cathode is a directly heated filament-cathode.

16. (Currently amended) The apparatus of claim 13 wherein the filament-cathode is an indirectly heated filament-cathode.

17. (Currently amended) An improved ion source apparatus for rapidly modulating ~~the~~an intensity of an ion beam, comprising:

an ion chamber having mutually opposed sides and configured to receive an ion precursor gas;

a filament-cathode located on one side of said ion chamber and operable to emit electrons for ~~the~~ ionization of the ion precursor gas for ~~the~~ generation of the ion beam;

a mirror electrode located on the other side of said ion chamber, and

at least one grid extending inside said ion chamber and positioned between said filament-cathode and said mirror electrode, said at least one grid being connected to a circuit to vary its potential relative to said filament-cathode and being operable so as to vary the number of electrons available in the ion chamber for ionization.

18. (Currently amended) The apparatus of claim 17 wherein the filament-cathode is a directly heated filament-cathode.

19. (Currently amended) The apparatus of claim 17 wherein the filament-cathode is an indirectly heated filament-cathode.

20. (Currently amended) The apparatus of claim 17 wherein said at least one grid is positioned in proximity to said filament-cathode so as to vary the number of electrons available for ionization between said at least one grid and said mirror electrode.

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REMARKS/ARGUMENTS

The amendments and remarks hereto attend to all outstanding issues in the pending office action of 25 August 2003. Claims 1 - 20 remain pending in this application. Claims 1-5, 7-11, 13, and 15-20 stand rejected. Claims 6, 12, and 14 have been objected to as being dependent upon a rejected base claim; however, the Examiner has indicated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

Applicant notes that the Office Action Summary indicates objection to, rather than rejection of claims 6, 12, and 14, in accord with the contents of the Examiner's paragraph "Allowable Subject Matter." However, the paragraph "Claim Rejections - 35 USC 102" includes the statement "Claims 1-20 are rejected under 35 U.S.C. §102(b)..." For purposes of this response, Applicant assumes that the statement "Claims 1-20 are rejected ..." is a typographical error, and that claims 6, 12, and 14 are not rejected under 35 U.S.C. §102(b).

Claims 1-5, 7-12, and 14-20 are amended as follows. Claims 1-5, 7-11, 13 and 15-19 are amended such that the terms "filament," "cathode," and "filament cathode" now read "filament-cathode," in order to maintain consistency and proper antecedent bases. Claims 1-3, 7-9, 13, and 17 are amended to properly introduce claim terms. Claims 3 and 14 are amended for clarity and consistency with preceding claims 2 and 6 and 12, respectively. Claim 20 is amended to maintain claim language of base claim 17.

No new matter is introduced through any of the claim amendments.

In the Specification

The first paragraph of the Detailed Description on page 6 and the second paragraph on page 8 of the specification are amended to correct typographical errors, including correction of the term "electrode mirror" to the intended term "mirror electrode," found throughout the specification.

The paragraph beginning on page 8 and concluding on page 9, and the paragraph beginning on page 9 and concluding on page 10, of the specification are amended to correct typographical errors and erroneous references to figures.

No new matter is introduced through any amendment to the specification.

Claim Rejections – 35 U.S.C. §102(b)

Claims 1-5, 7-11, 13, and 15-20 stand rejected as anticipated by U.S. Patent 4,684,848 ("Kaufman"). (Applicant assumes claims 6, 12, and 14 are not so rejected, as per the discussion under the first paragraph of "Remarks/Arguments.")

Applicant respectfully disagrees with the rejection of claims 1-5, 7-11, 13, and 15-20. The following is a quotation from the MPEP setting forth the standard for a holding of anticipation by a reference:

> To anticipate a claim, the reference must teach every element of the claim and "the identical invention must be shown in as complete detail as contained in the ... claim." *MPEP 2131* citing *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987) and *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989).

Claim 1

Applicant's claim 1, as amended, describes a method for rapidly controlling the rate of ion generation in an ion source, including the steps of:

- supplying current to [a] filament-cathode;
- supplying current to [a] mirror electrode; and
- controlling the potential difference between a filament-cathode and the mirror electrode by modifying the potential of the mirror electrode to control the number of electrons available for ionization.

Kaufman does not teach each of the step limitations of Applicant's claim 1.

The Examiner states "Kaufman et al teaches an apparatus and method for controlling ion generation in an ion source (Col. 11 Lines 15-21) comprising a filament cathode (46), a mirror electrode (106)... and means (56, 94, 104, and 108)

for controlling the potentials of the filament-cathode, grid, and mirror electrode to control the electron population and ion generation (Col. 6 Line 47 through Col. 7 Line 60)." However, item 106 is not a "mirror electrode" in either of the passages cited by the Examiner; it is instead defined (Kaufman, col. 9, lines 40-55) as a "decelerator grid." There is therefore no teaching of a "mirror electrode" anywhere in Kaufman, nor does Kaufman teach anything similar to Applicant's mirror electrode. Further, Fig. 8 of Kaufman shows that "decelerator grid 106" is located outside of chamber 84. In the embodiment of Fig.2, "mirror electrode 130" is located within ion chamber 110.

Kaufman also does not teach "modifying the potential of a mirror electrode," as required by claim 1. Not only is a "mirror electrode" lacking in Kaufman, but the potential of Kaufman's "decelerator grid 106" is fixed by an "energizing power source" 108 (see Kaufman, Fig. 8). Kaufman does not teach or suggest that power source 108 is capable of "modifying the potential" of the "decelerator grid." Kaufman thus clearly does not teach "controlling the potential difference between said filament-cathode and said mirror electrode by modifying the potential of the mirror electrode" as required by claim 1.

Further, Kaufman fails to teach an "ion source being operable to generate an ion beam," as required by claim 1. Examiner states, "Kaufman et al teaches an apparatus and method for controlling ion generation in an ion source (Col. 11 Lines 15-21)." But this passage in Kaufman (taken in full context, col. 11 lines 13-21) states only "Now, what may be quite similar apparatus is used instead to generate a broad electron beam which not only has no problem with also developed ions but also even uses ions which are present to increase the stability and definition of the electron beam. Furthermore, the same plasma also may serve as a source of ions to be utilized either separately or in combination with the electron beam and also directed toward the same or a different target." This passage in Kaufman only provides a general indication that ions may "be utilized" or "directed," but provides no teaching about how either of these are to be done. For example, it teaches that "the same plasma also may serve as a source of ions" but does not indicate what "the same plasma" is. More importantly, Kaufman does not teach "a method for controlling ion generation" nor an "ion source operable to generate an ion beam," as required by claim 1. Kaufman does

not, therefore, "teach every element of the claim" or show "the identical invention ... in as complete detail as contained in the ... claim" as required under 35 U.S.C. §102(b).

For at least the reasons argued above, Kaufman does not anticipate Applicant's claim 1. Reconsideration and allowance of claim 1 are respectfully requested.

Claims 2-5

Claims 2-5 depend from claim 1, and thus benefit from like arguments. There are also additional reasons for allowability of these claims.

For example, amended claim 2 further limits the method of claim 1 by requiring "the step of reducing an ion beam intensity by driving the potential of the mirror electrode positive relative to the filament-cathode." As discussed above, Kaufman does not teach Applicant's "mirror electrode;" it therefore cannot also teach driving the potential of the electrode, as required in claim 2.

Similarly, amended claim 3 limits the method of claim 1 by requiring "the step of increasing an ion beam intensity by driving the potential of the mirror electrode negative ..." Again, since Kaufman does not teach Applicant's "mirror electrode," it cannot also teach driving such an electrode negative, as in claim 3.

Claims 4 and 5, as amended, include the limitations "wherein the filament-cathode is a..." directly heated filament-cathode, and indirectly heated filament-cathode, respectively. The Examiner states that Kaufman "teaches at Col. 7 Line 11 that directly or indirectly heated cathodes may be used." However, this particular line of Kaufman discusses "direct or alternating current." The full text of Kaufman's surrounding passage is: "The opposite ends of the cathode 46 are connected across energizing source 56 and that source may deliver either direct or alternating current. As before, other types of cathodes such as a hollow cathode which, during normal operation, may require no heating current, may be substituted." (col. 7, lines 9-14). Kaufman's description of electrical connections, type of current delivered, and discussion that a certain cathode type "may require no heating current" do not describe either a "directly heated filament-cathode" or an "indirectly heated filament-

cathode" as in claims 4 and 5, respectively. Applicant therefore contends that Kaufman does not teach or suggest directly heated or indirectly heated filament-cathodes, and that claims 4 and 5 are not anticipated under 35 U.S.C. §102(b).

For the reasons argued above, in addition to the dependence of claims 2-5 on claim 1, Applicant respectfully requests reconsideration and allowance of each of claims 2-5.

Claim 7

As amended, claim 7 recites "A method for rapidly controlling the rate of ion generation in an ion source having a filament-cathode, a mirror electrode, and at least one grid, the ion source being operable to generate an ion beam ..." and the step of "... controlling the potential difference between said filament-cathode and said grid by modifying the potential of the grid relative to the filament-cathode to control the number of electrons available for ionization..." As discussed with respect to claim 1, the Examiner states "Kaufman et al teaches an apparatus and method for controlling ion generation in an ion source (Col. 11 Lines 15-21)." Applicants find no teaching of a "method for controlling ion generation" nor "ion source operable to generate an ion beam" in this passage, or elsewhere within Kaufman.

Additionally, Kaufman's power supplies 56, 94, 104 appear to be fixed, and therefore cannot "modify" the potentials of screen grid 88 or accelerator grid 90 relative to filament cathode 46. Claim 7 further requires a "mirror electrode," which has been shown to be absent from Kaufman (as in claim 1, argued above).

As Kaufman fails to teach a "method for controlling ion generation," a "source operable to generate an ion beam," "modifying the potential of a grid relative to the filament-cathode," or a "mirror electrode" – among other reasons - Applicant respectfully requests withdrawal of the rejection of claim 7 under 35 U.S.C. §102(b) and solicits allowance of claim 7.

Claims 8-11

Since claims 8 – 11 depend from claim 7, they benefit from like arguments. However, there are additional reasons for allowability of each these claims, as detailed herein below.

Amended claim 8 further limits claim 7 by requiring "the step of reducing ... ion beam intensity by driving the potential of [a] grid positive relative to the filament-cathode..." As argued above, Kaufman fails to teach a step of reducing ion beam intensity by driving the potential of a grid; all of Kaufman's grids are shown connected with fixed power supplies. Kaufman further fails to teach an ion beam, as argued above. Kaufman also does not teach or suggest a mirror-electrode, as required in claim 8.

Conversely, amended claim 9 limits claim 7 by requiring "the step of increasing ... ion beam intensity by driving the potential of [a] grid negative relative to the filament-cathode..." As argued above, Kaufman fails to teach a step of increasing ion beam intensity by driving the potential of a grid; all of Kaufman's grids are shown connected with fixed power supplies. Kaufman further fails to teach an ion beam, and does not teach a or suggest a mirror-electrode, as required in claim 9.

Amended claims 10 and 11 include the limitations of directly heated and indirectly heated filament-cathodes, respectively. Applicant contends, as discussed with respect to claims 4 and 5, that neither directly heated nor indirectly heated filament-cathodes are taught in Kaufman.

For the reasons argued above, in addition to the dependence of claims 8-11 on claim 7, Applicant respectfully requests reconsideration and allowance of each of claims 8-11.

Claim 13

As amended, claim 13 recites "An improved ion source apparatus for rapidly modulating the intensity of an ion beam" with "a mirror electrode having a potential therewith and located on the other side of said ion chamber, said mirror electrode being connected to a circuit to vary its potential relative to said filament-cathode..." As noted above, Kaufman's power supplies appear to be fixed. Kaufman also does not disclose generating an ion beam, and therefore Kaufman does not teach "rapidly modulating the intensity of an ion beam." Claim 13 also requires a "mirror electrode," which again is absent from Kaufman. Since Kaufman does not teach (1) "rapidly modulating the intensity of an ion beam"; (2) "a mirror electrode," or (3) "said mirror

electrode being connected to a circuit to vary its potential" as required in claim 13, Applicant respectfully requests withdrawal of the rejection of claim 13 under 35 U.S.C. §102(b).

Claims 15-16

Since claims 15 and 16 depend from claim 13, they benefit from like arguments. However, amended claims 15 and 16 also contain the limitations of directly heated and indirectly heated filament-cathodes, respectively. Applicant contends, as discussed with respect to claims 4 and 5, that neither directly heated nor indirectly heated filament-cathodes are taught in Kaufman.

For at least the reasons argued above, in addition to the dependence of claims 15 and 16 on claim 13, Applicant respectfully requests reconsideration and allowance of each of claims 15 and 16.

Claim 17

Amended claim 17 recites "An improved ion source apparatus for rapidly modulating the intensity of an ion beam" with "a mirror electrode located on the other side of said ion chamber" and "at least one grid being connected to a circuit to vary its potential relative to said filament-cathode and being operable so as to vary the number of electrons available in the ion chamber...." As noted above, Kaufman fails to teach generating an ion beam, and Kaufman's power supplies appear to be fixed such that they do not "modulate the intensity of an ion beam." Claim 17 also requires a "mirror electrode located on the other side of said ion chamber." Not only does Kaufman fail to teach Applicant's mirror electrode, Kaufman further fails to teach a mirror electrode "located on the other side of said ion chamber." Furthermore, Kaufman's grids do not "extend inside said ion chamber" (they are outside chamber 84, as seen in Kaufman's Fig. 8) or "connect to a circuit to vary its potential relative to said filament-cathode and being operable so as to vary the number of electrons available in the ion chamber for ionization," as required by claim 17. Being connected with fixed power supplies, Kaufman's grids are not "operable to vary" the number of electrons available in an ion chamber for ionization.

Since, among other reasons, Kaufman fails to teach a method to rapidly control ion generation, a source operable to generate an ion beam, a mirror electrode, location of the mirror electrode on the other side of an ion chamber, or circuitry connected to a grid rendering it "operable so as to vary the number of electrons available in the ion chamber for ionization," Applicant respectfully requests withdrawal of the rejection of claim 17 under 35 U.S.C. §102(b) and solicits allowance of the claim.

Claims 18-20

Since claims 18 - 20 depend from claim 17, they benefit from like arguments. Additional support for patentability of claims 18-20 is laid out herein below.

Amended claims 18 and 19 contain the limitations of directly heated and indirectly heated cathodes, respectively. Applicant contends, as discussed with respect to claims 4 and 5, that neither directly heated nor indirectly heated filament-cathodes are taught in Kaufman.

Claim 20 recites "said mirror electrode," which has been shown to be absent from Kaufman.

For at least the reasons argued above, in addition to the dependence of the above claims on claim 17, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 18 - 20 under 35 U.S.C. §102(b).

Allowable Subject Matter

Applicant thanks the Examiner for his indication of allowable subject matter in claims 6, 12, and 14.

In view of the above Amendments and Remarks, Applicant has addressed all issues raised in the Office Action dated 25 August 2003, and respectfully solicits a Notice of Allowance for each of claims 1-20. Should any issues remain, the Examiner is encouraged to telephone the undersigned attorney.

A Petition for Three Month's Extension of Time to Respond, along authorization to charge the required, small entity fee of $475.00 to Deposit Account 12-0600, is submitted herewith. Applicant believes no further fees are due, however,

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if any additional fee is deemed necessary in connection with this Amendment and Response, please charge Deposit Account No. 12–0600.

Respectfully submitted,

LATHROP & GAGE L.C.

Date: 2/24/04

By: Curtis A. Vock

Curtis A. Vock, Reg. No. 38,356
Lathrop & Gage L.C.
4845 Pearl East Circle
Suite 300
Boulder, CO 80301
Tele: (720) 931-3011
Fax: (720) 931-3001